Runoff Quality: A simpler alternative to the TSS standards

Current Stormwater Quality Standards

Projects that are required to include stormwater treatment for quality under Chapter 500 may be required to meet a standard for reducing the discharge of Total suspended solids (TSS). Projects in lake watersheds, depending on their size and the lake's water quality, may need to meet either the "phosphorus standard" or an "80% TSS removal standard." Projects in most at risk coastal, riverine or stream watersheds may need to meet a "sliding scale" TSS removal standard (requiring between 40% and 80% TSS removal depending on the percentage of the project parcel that will be impervious).

Problems with the current TSS standards

Experience with the TSS removal standard has shown that:

- Determining precise removal efficiencies for BMPs is difficult even under standardized conditions;
- Removal efficiencies are variable based on the nature of the storm event (how much runoff occurs and how it is distributed over time) and on the particle size distribution of the sediment load being carried by runoff.
- BMPs with typical removal efficiencies of less than 60% to 70% do not remove much of the finer particles (silt and clay size). These fine particles are of greater concern than the coarse particles in that phosphorus, heavy metals and other toxins will readily attach to, and be transported with, fine particles.
- The intent of the "sliding scale" TSS standard was to encourage developers to minimize the impervious area on their sites by requiring less stringent removal for less dense developments. Where it has been applied in coastal most at risk watersheds and on Site Law projects in stream watersheds, the sliding scale standard does not appear to have accomplished this, perhaps because large lots are often available for development. The result is that much of the development has had to apply only minimal TSS reduction that is removing, at best, the coarser sand fraction and probably providing little protection of stream quality. This often happens on parcels where there is plenty of room to implement more effective stormwater controls.
- On the other hand, the "sliding scale" TSS standard requires that relatively small developments that are located on small lots, and therefore have a high percent imperviousness, have to provide a high level of TSS removal. This is often difficult because of lack of space and head, and the marginal cost of treatment may be more difficult for small projects to handle. This problem will become more acute as more small developments (down to 20,000 sq. ft.) come under regulation with the establishment of a list of most at risk streams.

Proposed alternative quality standards

In an effort to address some of the problems stated above and also to simplify the standards, the department is proposing an alternative standard that, instead of a specific TSS removal standard, requires one of three levels of stormwater treatment depending on the size of the proposed development and the sensitivity of the receiving stream. It also allows reduction to a lower level of treatment if activities that earn certain credits are included in the project proposal. See the proposed alternative quality standards that follow this discussion.

The proposed alternative standards address some of the problems listed above.

- Rather than assigning a specific pollutant removal efficiency to a given stormwater treatment system design, DEP needs only to assign a Level of Stormwater Treatment (A, B or C) based on the range of TSS and phosphorus removal that could reasonably be expected to be achieved by the treatment system. This kind of decision is much more easily supported by the available data on BMPs, and recognizes the limitations of accurately predicting specific pollutant removal for any given treatment system on any given site. Simply stated, Level A treatment systems can be expected to remove the coarser sediment fractions and floating oil and grease, with perhaps some incidental removal of smaller

particles. Level B treatment systems will remove, in addition to the coarse sediments and floatables, a substantial portion of the finer particles with which much of the phosphorus and heavy metals are associatied. Level C BMPs should remove a high percentage of the fine sediment and should also be able to remove some of the dissolved nutrients and metals.

- By requiring lower levels of stormwater treatment to smaller developments, we are recognizing that these developments are the ones that are most likely to have space and marginal cost limitations. This is particularly true for projects with less than 1 acre of new impervious area, where for most at risk stream watersheds, we would only require Level A BMPs.
- The credits allow a reduction in required stormwater treatment level for either on- or off-site actrivities that will be likely to provide equivalent, though not necessarily parallel, benefits to the stream. The three types of credits identified below are examples. This section would likely be expanded to include, at least in non-attainment watersheds, options for credits addressing specific problems identified in TMDLs or other watershed restoration plans.

Proposed Alternative Stormwater Quality Standards

The applicant must incorporate stormwater treatment systems, or stormwater treatment systems in combination with credits, that, as determined by the Department, provide at least the level of stormwater treatment required for the project's size and receiving water type as indicated in the following matrix:

Required Level of Stormwater Quality Treatment by Project Size and Location				
Status of downgradient water body	Impervious Area			
	20,000 sf - 1 acre	1 acre – 3 acres	3 acres – 10 acres	10 or more acres
Impaired	Level B	Level B	Level C	Level C
Most at Risk	Level A	Level B	Level B	Level C
Sensitive and Threatened		Level A	Level B	Level C
All Other			Level A	Level B

The Department shall base its determination of the Stormwater Treatment Level appropriate for a given stormwater treatment design on the following:

Stormwater treatment measures that provide:	Shall include measures that, in the judgment of the Department and based on best available information, can be expected to remove and retain the following percentage of the typical annual Total Suspended Solids and Phosphorus loads from a typical urban source area.	
	TSS	Phosphorus
Stormwater Treatment Level A	60% - 70%	30% - 40%
Stormwater Treatment Level B	70% - 85%	40% - 60%
Stormwater Treatment Level C	85% - 100%	60% - 75%

Credits

Credit will be allowed toward the compliance with the required stormwater treatment for certain actions in accordance with the following table:

Treatment Level Applied + Credit	Equivalent Stormwater Treatment Level
Level A + 1 credit	Level B
Level B + 2 credits	Level C

Some examples of actions that would be worth a single credit follow:

- Use of BMPs that will infiltrate at least 1 inch of runoff from at least 50% of the project's impervious areas.
- Restoration of at least 75' along the stream (at least 50' wide) of currently developed or disturbed riparian area to a forested condition and protection of the restored condition in deed restrictions and/or easements for every acre of project impervious area and every 4 acres of project non-impervious disturbed area.
- Retrofit of extended detention sufficient to meet the 12 hr stream protection standard for the uncontrolled (or inadequately controlled) runoff from at least one acre of existing impervious area within the stream watershed for every acre of project impervious area and every 4 acres of project non-impervious disturbed area

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Some outstanding questions:

- Does the required level of stormwater treatment need to be applied to all the runoff from 100% of the project's disturbed and impervious areas? Is it adequate to let some small percentage (i.e. 5%, or maybe 10%) be discharged with no or lesser levels of treatment if site limitations make it infeasible to capture 100% of the runoff?
- Can over-treatment of runoff from part of a project's impervious and disturbed area be balanced with under-treatment of runoff from another part of the project? If so, how can this be accomplished to insure that the net level of pollutant export from the project is no greater than it would have been if runoff from the entire project were treated to the required level?